RESOURCE AND PATIENT MANAGEMENT SYSTEM

Laboratory
(LR)

Patch Notes

Version 5.2 Patch 15
March 2003

Information Technology Support Center
Division of Information Resources
Albuquerque, New Mexico

PREFACE

This manual contains installation information and lists of technical additions for the IHS RPMS Laboratory package, V 5.2 Patch 15.

TABLE OF CONTENTS

1.0 Release Notes

This KIDS build contains the following items:

- All of the VA software that was distributed with VA LAB PATCH LR*5.2*215 which was the VA's LOINC patch. It also contains any changes made by Cimarron to the files distributed with the VA patch.
- All BLS* software including routines, Data dictionaries and options added by Cimarron in support of the LOINC project.
- All BLR* and LR* software added to support LOINC project.
- Changes made to incorporate the Purpose of Visit (POV) requirements including additional prompts, DD changes to LAB ORDER ENTRY (#69) and changes to reports and screen displays.

LOINC (Sentinel Project)
Note: See VA documentation that accompanied LR*5.2*215 for detailed description of VA distributed LOINC software. You can download this at ftp://ftp.va.gov/vista/Software/Packages/Lab%20Service%20-%20LR/LR52_215/

2.0 Special Precaution

If your site is running any non RPMS software that interfaces directly with the RPMS Laboratory package, or you have made local modifications, or an outside vendor has made changes to the RPMS Laboratory package itself, it is imperative that you contact your software vendor **PRIOR** to the installation of this patch to insure that the package's functionality will not be disrupted as a result of the patch installation.

3.0 Installation Notes

3.1 General Information

- Read the entire notes file prior to attempting any installation.
- Make a copy of this distribution for offline storage.
- Print a copy of all notes and/or readme files.
- If you received this distribution on tape media, please remember to return the tape to the originator.
- It is recommended that you capture the terminal output during the installation using an auxport printer attached to the terminal you are performing the software installation at. Capturing the output will ensure a printed audit trail if any problems arise.

WARNING: It is imperative that the Lab Manager be contacted prior to installing this patch. Changes to the lab ordering process are included.

3.2 Contents Of Distribution

- lr__0520.15k.gz
- lr__0520.15n.pdf Patch 15 installation guide and technical information
- lr__0520.15o.pdf Patch 15 User's Guide Addendum

3.3 Requirements

- VA Kernel V 8.0 or higher
- VA FileMan V 21.0 or higher
- MailMan V 7.1 or higher
- The following RPMS modules (post Y2K or higher)
  - BLR IHS Laboratory, Version 5.2, Patches 1-14
  - LR Lab Service, Version 5.2, Patches 1-14
  - APCD V 2.0, Patch 5
  - APCD V 2.0, Patch 6 only required for Lab sites using the Blood Bank module

    Warning: If you are running the Blood Bank module and APCD V 2.0, Patch 6 has not been released, do NOT install LR Patch 15

  - GIS V 3.01, Patches 1, 2, and 4

Warning: Install the GIS patches only if you are participating in the CDC Sentinel Surveillance project.

- •sendto1.v02.tar (AIX sites only) call help desk

4.0 Installation Instructions

1. It is strongly suggested that a system backup is performed before these builds are installed.

2. Make sure all lab users are off the system.

3. Decompress the lr__0520.15k.gz file.

4. Halt the HLLP interface job. Use System Status to find the HLLP job number and then kill it. Check System Status again to make sure another HLLP job did not start.

5. Ensure that the Lab PCC link is current by looking at LS- Link Status in the BLRMENU. The date is at the top of the screen. Stop it by using the Start/Stop option in the BLRMENU.

6. Save off the following globals:
   - ^LAB(95.3
   - ^LAB(95.31
   - ^LAB(64.061
   - ^LAB(64.2
   - ^BLSLMAST

7. Kill or use global delete to delete the following globals:
   - ^LAB(95.3)
   - ^LAB(95.31)
   - ^BLSLMAST

8. Before beginning the install, change the characteristics of the ^BLSLMAST global in the production UCI using ^%GCH and set it to never journal (option 3). It is suggested that journaling be off for this global.

9. This is a KIDS install. Load distribution lr__0520.15k. After it is loaded, install it.

   NOTE: This install takes approximately 10 minutes due to the data being downloaded.

10. After the patch has been successfully installed, restart the HLLP background job using the Initiate The Background Task option from the HL Main Menu, V 1.5. Check the system status to ensure that the task has started.

11. Restart the Lab/PCC link using the Start/Stop option in the BLRMENU.

5.0 Initial Setup

5.1 Assigning LOINC codes to the Laboratory Test File (#60)

For those sites which **WERE NOT** alpha testing LOINC, proceed with the LOINC code mapping.

1. After installation turn on the LOINC application by editing the BLR MASTER CONTROL file as follows:

```
INPUT TO WHAT FILE: OPTION// BLR MASTER CONTROL       (2 entries)
EDIT WHICH FIELD: ALL// LAB APPLICATION PLUG-IN       (multiple)
                  EDIT WHICH LAB APPLICATION PLUG-IN SUB-FIELD: ALL//
THEN EDIT FIELD:
Select BLR MASTER CONTROL SITE: <Your Site>
Select LAB APPLICATION PLUG-IN: LR*5.2*1015
                        PLUG-IN ON/OFF?: ON
```

Figure 5-1: Turning on the LOINC application through the BLR Master Control File

2. Add the LOINC MAIN MENU (LRLOINC) to the Lab Liaison Menu (LRLIAISON).

3. Refer to the Patch 15 Addendum on how to use the auto-mapper and manual mapper for assigning LOINC codes to your tests in the Laboratory Test File. Contact ITSC for assistance (see page 31 for contact information).

5.2 Setting up the LOINC Export Parameters

WARNING: Complete this section **ONLY** if you are participating in the CDC sentinel surveillance project. If you are unsure whether you are participating in this project, contact ITSC

1. Set up the LOINC export parameters by using FileMan to edit following fields in the BLR MASTER CONTROL file:

```
Select BLR MASTER CONTROL SITE: <Your Site>
LOINC DAYS TO KEEP EXPORT LOG: 10
LOINC EXPORT DESTINATION IP: ftp.ihs.gov
LOINC LOCAL DESTINATION: c:\inetpub\ftproot\pub\ (EXAMPLE: this is on your system)
LOINC LOG IN ID: CDCSentinel
LOINC LOG IN PASSWORD:(contact ITSC for password)
```

Figure 5-2: Setting up the LOINC Export Parameters

- The **LOINC DAYS TO KEEP EXPORT LOG** entry should be decided by the Site Manager and the Lab Supervisor.

- The **LOINC LOCAL DESTINATION** entry should be decided by the Site Manager.

- The **LOINC LOG IN PASSWORD** can be acquired from the Technology Support Center (1-888-830-7280).

2. Install the scripts. (AIX Sites Only) Unpack and install the sendto1.v02.tar file. This tar file contains SENDTO1 and FTPCHECK. These routines need to be installed into the /usr/bin directory. GETFROM1 also needs to be linked to SENDTO1. Contact ITSC for assistance if necessary.

5.3 For Sites That Alpha Tested LOINC

LOINC pilot sites: Rapid City, Ignacio, PIMC, AIH, WW Hastings

For those sites that **WERE** alpha testing LOINC and wish to set up the Electronic Signature enhancement, click on the following link and proceed to page 12:

http://www.ihs.gov/Cio/RPMS/PackageDocs/lr/lr__0520.13i_ESIG.pdf

Once the patch 15 install is complete, contact ITSC (section 8.0) for instructions on turning on the Electronic Signature and LOINC plug-ins.

6.0 Patch 15 Additions

6.1 Data Dictionaries

BLR MASTER CONTROL file 9009029
Field: 9009029.02101 LAB APPLICATION PLUG-IN
Field: #.01 LAB APPLICATION PLUG-IN
#1 PLUG-IN ON/OFF?

> **Note**: This is used to "turn on" the Automated Sentinel Surveillance System (LOINC) functionality.

LABORATORY TEST file 60
Field: 64.1 RESULT NLT CODE
Field: 95.3 LOINC CODE in the SITE/SPECIMEN sub-file

TOPOGRAPHY FIELD file 61
Field: .09 LEDI HL7 field

WKLD CODE file 64 full data dictionary with data.

LAB ELECTRONIC CODES file 64.061 full data dictionary with data

> **Note**: Many entries were added to this file to support the additional LOINC codes added to the LAB LOINC file.

WKLD SUFFIX CODES file 64.2 full data dictionary with data.

> **Note**: Many entries were added to this file to support the additional LOINC codes added to the LAB LOINC file.

LAB LOINC file 95.3 full data dictionary with data.

> **Note**: Many entries were added to this file to support the additional LOINC codes added to the LAB LOINC file.

Two fields were added by Cimarron in support of the LOINC Project:
Field 9999999.01 CHECKSUM Node 9999999 Piece 1 numeric
Field 9999999.02 FULL LOINC Node 9999999 Piece 2 Free text

LAB LOINC COMPONENT file 95.31 full data dictionary with data.

> **Note**: Many entries were added to this file to support the additional LOINC codes added to the LAB LOINC file.

BLS IHS LOINC MASTER file 90220 full data dictionary with data. Global ^BLSLMAST(

FIELD #	FIELD NAME	SUBSCRIPT	PIECE	TYPE
.01	NAME	D0,0	1	F
.02	SITE/SPECIMEN	D0,0	2	F
.03	UNITS	"	3	F
.04	LOINC	"	4	P
.05	LOINC (CODE)	"	5	F
.06	NOT LOINC-ABLE	"	6	S
.07	.01 NAME	"	7	F
1101	SITE FROM	D0,11	1	F

This file contains a master index of all tests obtained from the 5 pilot sites. It contains the name, site/specimen and units and loinc code. This file will be used to map the loinc code to the Lab 60 entry at the site.

BLS LOINC EXPORT file 90221 full data dictionary with data. Global ^BLSLX(

FIELD #	FIELD NAME	SUBSCRIPT	PIECE	TYPE
.01	V LAB	D0,0	1	P
.02	DATE ADDED	"	2	D
.03	DATE EXPORTED	"	3	D

This file is used to flag all V Lab entries that will be exported to CDC. Each time a V Lab entry is created a routine BLSLX is called from APCDALVR. If the site has the Add on for patch LR*5.2*1015 flag is set to ON then this file will be populated with a pointer back to the V LAB entry. Once a month (or at a designated interval) all entries in this file will generate HL7 messages to be passed to CDC.

BLS EXPORT LOINC LIST file 90222 full data dictionary with data. Global ^BLSELL(

FIELD #	FIELD NAME	SUBSCRIPT	PIECE	TYPE
.01	LOINC TO EXPORT	D0,0	1	P

This file contains all LOINC codes that will be passed to CDC. This list can be modified over time by the site. Subsequent patches should not overwrite their data.

6.2 Routines

VA distributed routines: LRLNC0, LRLNC1, LRLNCHL7, LRLNCNLT, LRLNCPMP, LRLNCPRT, LRLNCTOP, LRLNCUTL, LRVER1

Note: No local changes were made to these routines.

BLSELL: This routine is called from option BLS ENTER TESTS TO EXPORT (Update Table of LOINC Codes to Export to CDC). It utilizes list manager to allow a site to view, add, or delete LOINC codes from file 90222 which is the list of LOINC codes that drives which V LAB entries get exported to CDC. This routine also contains the banner sub-routine for the menu option BLSMENU.

BLSLOINC: This routine is a utility routine written to assist in the assigning of LOINC codes to the BLS IHS LOINC MASTER FILE. This routine is called from programmer mode by the person assigning Loinc Codes to all tests on the master file on the LOINC machine. This routine does not need to be distributed with the patch but even if it is distributed it will not be used or called by any option at the site. It should be added or used locally.

BLSLX: This routine is called by APCDALVR when a V LAB is entered. If the V LAB entered is on the list of tests that CDC wants (checked by looking at loinc code and checking the BLS EXPORT LOINC LIST) then the V LAB ien is filed into the BLS EXPORT DATA file. This routine is also the routine called from option BLS EXPORT DATA when data is exported.

BLSMAP: This routine is the routine called from option BLS MAP LOINC TO TEST (Map LOINC Codes to Tests in File 60) and is used to automatically map loinc codes from the BLS HIS LOINC MASTER File to tests in LAB(60. This routine goes through all tests in the local sites LAB(60 global. It looks at all site/specimen entries in the site/specimen multiple. If the test does not currently have a LOINC Code (in the 95.3 node) it will attempt to find the test in the master file by name, site/specimen and units. If one is found the LOINC code field of the site/specimen multiple for that test is updated with the loinc code.

BLRPRE: This routine does a check to see if patch 12 of LR is installed. If it is not the install aborts. It also verifies that backups have been performed.

BLSULLF: This is a routine written to update the LAB LOINC file with new codes obtained from an excel spreadsheet from the Regenstrief Institute. It was used to add all of the new LOINC codes. It does not need to be distributed with the package and may never be used again.

BLRPOST: This routine deletes fields from BLR MASTER CONTROL file. It also sets the READ, WRITE and AUDIT settings for some fields.

6.3 Options

6.3.1 VA Distributed Options

LR LOINC HL7 SPECIMENS	SEND TO SITE
LR LOINC LEDI HL7 CODE	SEND TO SITE
LR LOINC LOOKUP	SEND TO SITE
LR LOINC MAP	SEND TO SITE
LR LOINC PRINT 60/LOINC MAP	SEND TO SITE
LR LOINC PRINT NLT/LOINC	SEND TO SITE
LR LOINC PRINT RESULT NLT	SEND TO SITE
LR LOINC TOPOGRAPHY	SEND TO SITE
LR7O 60-64	SEND TO SITE
LR7O 60-64 AUTO	SEND TO SITE

LR7O 60-64 MANUAL	SEND TO SITE
LR7O AUTO RESULT NLT	SEND TO SITE
LR7O MAN RESULT NLT	SEND TO SITE
LRLIAISON	USE AS LINK FOR MENU ITEMS LRLOINC

6.3.2 IHS Added Options

BLS CLEANUP EXPORT LOG	SEND TO SITE
BLS ENTER TESTS TO EXPORT	SEND TO SITE
BLS EXPORT DATA	SEND TO SITE
BLS MAP IND TEST	SEND TO SITE
BLS MAP LOINC TO TEST	SEND TO SITE
BLS REMOVE A FILE(S)	SEND TO SITE
BLS RESEND EXPORT FILE	SEND TO SITE
BLSMENU	SEND TO SITE

6.4 Protocols

BLS ADD LOINC	SEND TO SITE
BLS NEXT SCREEN	SEND TO SITE
BLS PREVIOUS SCREEN	SEND TO SITE
BLS QUIT	SEND TO SITE
BLS REMOVE LOINC	SEND TO SITE
BLS UPDATE LOINC'S TO EXPORT	SEND TO SITE

6.5 List Templates

BLS LOINC TO EXPORT	SEND TO SITE

6.6 Mail Groups

BLR APPLICATION PLUGIN WARNING SEND TO SITE
Members: should be the Site manager and the Lab Supervisor

BLR ERROR OVERFLOW WARNING SEND TO SITE
Members: should be the Site Manager and the Lab Supervisor

BLS EXPORT FILE SENT SEND TO SITE
Members: should be the Site Manager

6.7 Bulletins

BLR APPLICATION PLUGIN WARNING	SEND TO SITE
BLR ERROR OVERFLOW WARNING	SEND TO SITE
BLS EXPORT FILE SENT	SEND TO SITE

6.8 Purpose Of Visit (POV) Functionality

Medicare requirements published in the Nov 2001 Federal Register require that labs maintain information related to the medical necessity for lab orders. This patch includes changes to the RPMS Laboratory Package to capture the diagnosis or sign/symptom for each lab test ordered. This change includes the addition of a new "Enter the sign/symptom for this order:" prompt during the lab ordering process. **The Sign/ Symptom field is required**. The person placing the order must enter the sign or symptom to complete the order.

> **WARNING:** As changes to the lab process are required by the software update, it is imperative that the Lab Manager be made aware that this patch is being installed.

6.8.1 Data Dictionaries

LAB ORDER ENTRY (#69)
Field #9999999.1 SIGN OR SYMPTOM

6.8.2 Options

BLR LAB POV COMPLIANCE REPORT
Added to BLRMENU, but this report may also be placed on a menu convenient for the Medical Records Supervisor to use

6.8.3 Print Template

The BLR LAB POV COMPLIANCE REPORT can be used to monitor the compliance with the Medical Necessity for lab orders. The report can be run for a range of dates and will display the following:

```
LAB POV Compliance Report                        JAN  6,2003  08:20    PAGE 2

ENTERING PERSON     PROVIDER     PANEL/TEST      CPT CODE   SIGN OR SYMPTOM
MOORE,CATHE         ADAM,ADAM    HEMATOCRIT      85014      ANEMIA
MOORE,CATHE         ADAM,ADAM    PROTIME         85610      COUMADIN THERAPY
```

Figure 6-1: BLR Lab POV Compliance Report

7.0 Technical Development

This section describes the development and implementation of the Sentinel Surveillance System (LOINC Project). The various components of the project were:

1. Review and implementation of the VA LOINC Patch
2. Creation of a master IHS Lab LOINC table consisting of all lab tests from test sites
3. Assigning a LOINC code to all tests in the Master File
4. Developing software to automatically map a LOINC code to lab tests in File 60 at IHS facilities
5. Developing software to pass LOINC Codes, collection sample and Result Date/time to PCC via the Laboratory to PCC link
6. Developing software to flag certain tests for export to CDC and generating a file of HL7 messages to be automatically sent to IHS for delivery to CDC

Each of these project components is described in detail in this document. A sample of entering a test into the Lab system through flagging the test for export is provided as well. For information on the contents of the IHS lab patch, which contains all of the software changes and information on how to install the patch please refer to the Installation Guide provided with the patch.

7.1 VA LOINC Patch

The first step in this project was to obtain and review the software developed by the Veteran's Administration to handle mapping of LOINC codes to existing tests in the Laboratory test file (file 60). This software patch, LR*5.2*215, is described in detail in the "Technical, Installation and User's Guides" document provided by the VA. All contents of this patch are being distributed by IHS as a part of the IHS LOINC Patch LR*5.2*1013.

Below is a list of the key pieces of the VA patch that are being used by IHS. For a complete description of all contents of the VA patch, please see the VA documentation.

- **File #95.3 LAB LOINC** with data, which contains all LOINC codes along with their description and many other data elements. An example of an entry in this file:

```
CODE: 14760                                COMPONENT: GLUCOSE
  CHALLENGE: 2H POST MEAL                  PROPERTY: Substance Concentration
  TIME ASPECT: POINT                       SYSTEM: Blood capillary
  SCALE TYPE: Quantitative                 CLASS: CHAL
  SOURCE: OMH                              MAP TO: 14760
  DATE LAST CHANGED: JUL 12, 2000          CHANGE TYPE: MIN
  CHANGE REASON: changed class from CHEM
RELATED NAMES: GLUCOSE PC
  FULLY SPECIFIED NAME: GLUCOSE~2H POST MEAL:SCNC:PT:BLDC:QN
  CHECKSUM: 3                              FULL LOINC CODE: 14760-3
```

Figure 7-1 : ·File #95.3 LAB LOINC Sample Entry

NOTE: Two fields were added to this file for IHS use: 9999999.01 CHECKSUM and 9999999.02 FULL LOINC CODE.

- **File #95.31 LAB LOINC COMPONENT**, with data, which contains the name of the component or analyte measured, e.g. potassium, hemoglobin, or hepatitis C antigen, a descriptive name of the component and related names.

- New field **LOINC CODE** in **the LABORATORY TEST file (file #60)**. This field contains a pointer to the LAB LOINC file and is contained in the Site/Specimen multiple. This field is used to associate a LOINC Code with a Lab test, site/specimen, and units entry. Example of LAB TEST with LOINC code assigned:

```
LABTEST IEN: 469                           NAME: FASTING GLUCOSE
  TYPE: OUTPUT (CAN BE DISPLAYED)
  SUBSCRIPT: CHEM, HEM, TOX, SER, RIA, ETC.
  LOCATION (DATA NAME): CH;149;1           LAB COLLECTION SAMPLE: URINE
  FIELD: DD(63.04,149,                     HIGHEST URGENCY ALLOWED: STAT
  REQUIRED TEST: NO                        FORCED URGENCY: ROUTINE
  PRINT NAME: FAST                         PRINT ORDER: 36.1
  DATA NAME: FASTING GTT
SITE/SPECIMEN: BLOOD                       UNITS: mg/dL
SITE/SPECIMEN: URINE                       LOINC CODE: 2350
SITE/SPECIMEN: SERUM                       REFERENCE LOW: 70
  REFERENCE HIGH: 110                      CRITICAL LOW: 50
  CRITICAL HIGH: 145                       UNITS: mg/dl
  TYPE OF DELTA CHECK: PERCENT             DELTA VALUE: 15
  LOINC CODE: 14996
SITE/SPECIMEN: PLASMA                      REFERENCE LOW: 70
  REFERENCE HIGH: 110                      UNITS: mg/dL
  LOINC CODE: 14996
```

Figure 7-2: Example of LAB TEST with LOINC code assigned

- The following options are distributed by the VA patch. Documentation on how to use these options is contained in the VA's distributed documentation. The only option that will be routinely used by IHS facilties is 8 Print Lab Tests Mapped/Not Mapped to LOINC Codes.

```
LOINC Main Menu
1      Specimen HL7 Codes Print
2      Topography Print With/Without LEDI HL7 Codes
3      Add/Edit Topography Specimen HL7 Code
4      National Laboratory File ...
5      Lookup LOINC Code
6      Map Lab Tests to LOINC Codes
7      NLT/LOINC Codes Print
8      Print Lab Tests Mapped/Not Mapped to LOINC Codes
9      Lab Tests With/Without Result NLT Codes Print
```

Figure 7-3: Sample LOINC Main Menu

NOTE: The option to print lab tests Mapped and Not Mapped was modified for IHS use because it didn't work properly. The routines (LRLNC0, LRLNCPMP) are well documented within the routines with the IHS modifications.

7.2 Creating IHS Master LOINC table

In order to build an initial IHS Master LOINC table the entries from the Laboratory Test file (File #60) were gathered from the following 4 production sites: Albuquerque Indian Hospital, Phoenix Indian Medical Center, Ignacio Health Center, Rapid City Indian Hospital. In addition, the entries from File #60 that were distributed with version 5.2 of the Lab package were obtained and the entries from the test system (Crow database) were used. At each site a temporary global was created consisting of each name or synonym, site/specimen and units combination for each test found in the Laboratory test file. This temporary global had the following format:

```
^BLSMAST("BLSLAB60",sitename,"NAME",test name or
synonym,site/specimen,units,ien of test)=""
```

```
^BLSMAST("BLSLAB60","AIH","NAME","CMV IgG","SERUM","Index",1665058)=""
^BLSMAST("BLSLAB60","AIH","NAME","CMV IgM","SERUM","Index",1665059)=""
^BLSMAST("BLSLAB60","AIH","NAME","CO2","BLOOD","mEq/L",179)=""
^BLSMAST("BLSLAB60","AIH","NAME","CO2","SERUM","mEq/L",179)=""
^BLSMAST("BLSLAB60","AIH","NAME","CO2(Tricore)","BLOOD","mmol/L",9999313)=""
^BLSMAST("BLSLAB60","AIH","NAME","CO2(Tricore)","SERUM","mmol/L",9999313)=""
^BLSMAST("BLSLAB60","AIH","NAME","COCAINE QL(URINE)","URINE","ng/ml",460)=""
^BLSMAST("BLSLAB60","AIH","NAME","COCCIDIODES AB BY
COMP.FIX","SERUM","Titer",12
44)=""
^BLSMAST("BLSLAB60","AIH","NAME","COHB%","ARTERIAL BLOOD","BLANKXXX",49)=""
^BLSMAST("BLSLAB60","AIH","NAME","COHB%","BLOOD","BLANKXXX",49)=""
```

Figure 7-4: Sample code

If the units field was blank in the site's file then the term "BLANKXXX" was used in the units subscript. One at a time, these 6 temporary globals were read into a master file on the LOINC test machine. This master file is called the BLS IHS LOINC

MASTER [file #90220, global ^BLSLMAST(]. The process for reading each site's entries was as follows:

1. Skip any test that began with the characters x, z, ZZ. These were tests that are no longer used or valid at the site.
2. Skip synonyms like a generic term "SMITHKLINE".
3. Uppercase all names, site/specimen and units values.
4. Strip all leading spaces, trailing spaces from all lab test names and units.
5. Using the name, site/specimen and units values look to see if that test is already in the master file. If it is not, add it to the master. If it is, skip it.

This process was very laborious and was done over many times as each site's tests were examined and oddities such as using a synonym of SMITHKLINE under numerous tests were found and eliminated from the master list. Oddities in naming tests, such as putting a "-" at the beginning of the name were also found and dealt with. The master file currently contains 9,295 entries comprised of all of relevant, unique name or synonym, site/specimen, and units combination from the 6 original files.

The BLS IHS LOINC MASTER file contains the following fields:

.01 NAME – name of test uppercase and stripped of spaces, etc.
.02 SITE/SPECIMEN - full site/specimen name
.03 UNITS - uppercase and stripped of spaces
.04 LOINC – pointer to LOINC table
.05 LOINC (CODE) – LOINC code assigned to this test
.06 NOT LOINC-ABLE – if this test cannot be assigned a LOINC code this is set to 1
.07 .01 NAME – not used
1101 SITE FROM – which site did this test originate from

```
NAME: G-6-PD, RBC, QUAL.                SITE/SPECIMEN: BLOOD
  UNITS: ENZYME ACT                     LOINC: 2356
  LOINC (CODE): 2356                    .01 NAME: G-6-PD, SCREEN

NAME: G-6-PD, RBC, QUAL.                SITE/SPECIMEN: BLOOD
  UNITS: U/G HGB                        LOINC: 2356
  LOINC (CODE): 2356                    SITE FROM: PIMC

NAME: GBM ANTIBODIES                    SITE/SPECIMEN: SERUM
  UNITS: UNITS                          NOT LOINC-ABLE: YES, CAN'T BE LOINCED
  .01 NAME: GBM ANTIBODIES

NAME: GLUCOSE                           SITE/SPECIMEN: SERUM
  UNITS: MG/DL                          LOINC: 6777
  LOINC (CODE): 6777                    .01 NAME: GLUCOSE

NAME: GLUCOSE                           SITE/SPECIMEN: PLASMA
  UNITS: MG/DL                          LOINC: 6777
  LOINC (CODE): 6777                    .01 NAME: GLUCOSE

NAME: GLUCOSE                           SITE/SPECIMEN: BLOOD
  UNITS: MG/DL                          NOT LOINC-ABLE: YES, CAN'T BE LOINCED
  .01 NAME: FASTING GLUCOSE
```

Figure 7-5: Sample entries from the Master file

This master file is distributed to all sites with Lab patch LR*5.2*1013 and will be used in auto-mapping LOINC codes to tests in the receiving site's Laboratory Test file.

7.3 Assigning LOINC Codes to Master File

Once the master file was established a process of assigning a LOINC code to each entry in the master file was begun. This mapping of LOINC codes was done by personnel with expertise in Laboratory coding systems. When this process was begun it was quickly determined that the LAB LOINC file received from the VA was quite out of date. This necessitated the need to get a more current LOINC table from the Regenstrief Institute.

A Tab Delimited ASCII LOINC Database, version 2.05, release date February 8, 2002, was downloaded from www.Regenstreif.org/loinc/.

When the updated file of LOINC codes was obtained, software was written to update the LAB LOINC file with all new entries. Several thousand LOINC codes were added to the file.

In order to facilitate the process of assigning a LOINC code to every test in the master file, a routine was written that loops through all tests in the master file that have not yet been assigned a LOINC code. The name, site/specimen and units values are displayed. The person assigning the LOINC code then has an option of marking the test as 'un-loincable', skipping this test or assigning a LOINC Code from the LAB LOINC table.

```
Test Name:     %O2
               LAB52
Site/Specimen: ARTERIAL BLOOD
Units:         %

     Select one of the following:

          1         Assign a Loinc
          2         Skip this one for now
          3         Mark as Un-Loincable
          4         Quit

Select Action: 1//Select Action: 1// 2  Skip this one for now


Test Name:     1,25-DIHYDROXYVIT D3
               LAB52
Site/Specimen: SERUM
Units:         PG/ML

     Select one of the following:

          1         Assign a Loinc
          2         Skip this one for now
          3         Mark as Un-Loincable
          4         Quit

Select Action: 1//
```

Figure 7-6: Assigning LOINC Codes to the Master File

The assignment of LOINC codes was made by two individuals, one using the tools described above to assign codes on line. The other individual used RELMA and manually assigned LOINC codes which were subsequently entered into the master file using the mapping tool described above. When a choice of LOINC codes was in question, a search of the entire Regenstrief LOINC database was performed, and all entries for that analyte were reviewed for additional commentary to assist with code selection. LOINC codes were assigned based on the directions provided in the LOINC User's Guide published by the Regenstrief Institute based on:

- Analyte/component (name of the test)
- Information about a challenge (e.g. 1 HR post 100 gm Glucose challenge)
- System/sample (site/specimen)
- Property of measurement or observation (based on units or lack of units)
- Time aspect (point or moment in time vs. time interval)
- Type of scale (nominal, ordinal, quantitative – based on units or lack of units)
- Method (e.g. immunoblot, latex agglutination)

Challenges to assigning LOINC codes to tests in the IHS Laboratory database primarily related to lack of specificity or ambiguity in naming the tests and assignment of units. Listed below are specific issues encountered during the process

of assigning LOINC codes and the approach taken in developing the Master LOINC File.

1. If a test could not clearly be identified by its name, a LOINC code was not assigned and the test was marked as unloincable. (e.g. CAH)

2. If a test had a name that was not in agreement with its .01 name or site/specimen, a LOINC code was not assigned. (e.g. Urine Creatinine – Serum)

3. If a test had a site/specimen for which no LOINC code exists, no LOINC code was assigned.

4. If a test had no units assigned to a site/specimen and the only LOINC code available was a quantitative one, the LOINC code was assigned. (e.g. Magnesium – Ser/Plas)

5. IHS uses plasma and serum interchangeably for Chemistry and often sendout tests. If a LOINC code did not exist for a site/specimen of SER/PLAS the LOINC code for serum or plasma was used. (e.g. Renin – Serum assigned LOINC code for Renin - Plasma).

6. Version 5.2 of the Laboratory Package was distributed with blood as the site/specimen for all serum/plasma tests. Consequently, the LOINC codes assigned to these tests were those associated with ser/plas, serum or plasma. An exception was made where the test clearly specified arterial, capillary, or venous blood. (e.g. Calcium – Blood was mapped to Sodium – Ser/Plas)

7. The LOINC codes for urine microscopic sediment exams and other microscopic observations specify /HPF or /LPF. If the units did not match those of the LOINC code, a generic microscopy LOINC code was used.

8. Drug tests on urine or serum with no units are assumed to be screening in nature, the LOINC codes using arbitrary concentration, ordinal scale, and Screen have been used.

9. Many of the components of a CBC – WBC, RBC, Hgb, Hct, etc. and other quantitative tests can be classified as to methodology – manual, automated, or just quantitative in nature. Those tests where the methodology is clear based on name and units, have been assigned the specific code. Where the methodology was not clear, the more generic LOINC code for quantitative testing was used. (e.g. WBC – K/uL – Automated Count, Blasts % - Manual Count)

10. If a challenge dose is not specified in the name of a tolerance test, a generic post XXX challenge LOINC code has been assigned. (e.g. 2 HR GTT – serum – LOINC 2 Hr post XXX challenge)

11. Some tests such as turbidity may have multiple site/specimens including peritoneal fluid, synovial fluid, pericardial fluid,etc. If there was no specific LOINC code available, a generic LOINC code using a system (sample) of FLU or XXX was used.

12. Initial mapping showed that some tests had synonyms that were not in agreement with the actual tests. To prevent mismapping, no LOINC codes were assigned to these tests. (e.g. HBeAG was used interchangeably with Hep E Ag and HbeAB was used interchangeably with Hep E Ab.)

7.4 Auto-Mapping of LOINC codes ("the Mapper")

In patch LR*5.2*1013 the BLS IHS LOINC MASTER file is distributed with data so that each site's computer will have a copy of the Master file. The following menu and options are also distributed:

```
             ****************************
             **   IHS Lab LOINC Menu    **
             ****************************

                  CROW HOSPITAL


   CLN    Cleanup LOINC Export Log/Files
   EXP    Export HL7 Data to CDC
   MLC    Automatically Map LOINC Codes to Tests in File 60
   MLT    Manually Map a LOINC Code to a Laboratory Test
   RSN    Resend CDC Export File
   ULE    Update Table of LOINC Codes to Export to CDC
```

Figure 7-7: Lab LOINC Menu

After the patch is installed, the site will execute the option **MLC Automatically Map LOINC Codes to Tests in File 60.** This option runs a routine called **BLSMAP**. When this menu option is executed, the following dialogue is displayed to the user:

```
                          CROW HOSPITAL

                AUTO-MAP LOINC CODES INTO THE LABORATORY TEST FILE
This option is used to automatically map LOINC Codes from the IHS Master
LOINC table to your Laboratory test file (file 60).
The test must match the master by Test name, Site/Specimen and Units.  If a
match is found in the master file, that loinc code is added to your test
in the Laboratory test file.
Would you like a list of all Tests that were assigned a LOINC Code? Y//
```

Figure 7-8: Mapping menu option dialogue

If the user answers yes, then the auto-mapping takes place. The process by which the mapping is done, is as follows:

- Each entry in the "B" index of LAB(60, is examined. This contains all names and synonyms for all tests in the file.
- For each name or synonym found, each site/specimen entry in the site/specimen multiple for that test is examined, one by one. The name of the site/specimen is obtained and the units associated with the site/specimen is obtained.
- The name, site/specimen and units values are temporarily transformed in local variables in the following way:
  - All leading and trailing spaces are removed
  - The value is upper-cased.
  - If the units field is blank it is renamed "BLANKXXX"
- The 3 transformed values (name or synonym, site/specimen and units) are used to look up that test in the Master file. If an exact match is found, the LOINC code from the Master file is added to the LOINC Code field in the Site/specimen multiple in the Lab test entry in File 60 and processing for this entry ceases.
- If no match was found, the test name is massaged further by removing any non-numeric, non-alpha, non "%" characters from the beginning of the test name and a lookup is attempted a second time in the Master file. If the test is found then the LOINC code is assigned. If none is found in the master, no LOINC code is assigned.

Example:

1. B index is used and the term "1 hour GTT" is found which is a synonym of Lab Test ien 471, with a Name of 1 HR GTT;

2. The first site specimen in the site/specimen multiple is found to be BLOOD with a units of mg/dL

3. The 3 values are temporarily transformed into 1 HOUR GTT, BLOOD, MG/DL

4. The "AA" index on the BLSLMAST global is used to do a lookup on these 3 values. As shown the example of the "AA" index below, this test is found to be entry 6 in the Master control file.

```
^BLSLMAST("AA","1 HOUR","BLOOD","MG/DL",8291)=""
^BLSLMAST("AA","1 HOUR GTT","BLOOD","MG/DL",6)=""
^BLSLMAST("AA","1 HOUR GTT","PLASMA","MG/DL",8)=""
^BLSLMAST("AA","1 HOUR GTT","SERUM","MG/DL",7)=""
^BLSLMAST("AA","1 HR","BLOOD","MG/DL",8292)=""
^BLSLMAST("AA","1 HR GTT","BLOOD","MG/DL",9)=""
^BLSLMAST("AA","1 HR GTT","PLASMA","MG/DL",11)=""
^BLSLMAST("AA","1 HR GTT","SERUM","MG/DL",10)=""
^BLSLMAST("AA","1 HR GTT (PRENATAL)","BLOOD","MG/DL",8293)=""
```

Figure 7-9: Sample AA index

5. This is entry #6 in the BLS IHS LOINC MASTER file:

```
NAME: 1 HOUR GTT                          SITE/SPECIMEN: BLOOD
UNITS: MG/DL                             LOINC: 12646
LOINC (CODE): 12646                      .01 NAME: 1HR GTT
```

Figure 7-10: Entry #6 in the BLS IHS LOINC MASTER file

6. The LOINC code in entry 6, which is 12646, is then stuffed into the LOINC Code field of Blood Site/Specimen multiple entry in File 60 for test ien #471.

7. The other site/specimen entries (Serum and Plasma) are then used and the process for assigning a LOINC is repeated for each site specimen.

   The resulting Lab Test entry #471 looks like this:

```
LABTEST IEN: 471                           NAME: 1HR GTT
TYPE: BOTH
SUBSCRIPT: CHEM, HEM, TOX, SER, RIA, ETC.
LOCATION (DATA NAME): CH;151;1          UNIQUE ACCESSION #: YES
LAB COLLECTION SAMPLE: BLOOD            FIELD: DD(63.04,151,
HIGHEST URGENCY ALLOWED: ASAP           FORCED URGENCY: ROUTINE
PRINT NAME: 1Hr.GTT                     PRINT ORDER: 36.2
DATA NAME: 1HR GTT
SITE/SPECIMEN: BLOOD                      UNITS: mg/dL

SITE/SPECIMEN: SERUM                      UNITS: mg/dl
LOINC CODE: 12646
SITE/SPECIMEN: PLASMA                     REFERENCE HIGH: 140
UNITS: mg/dL                            LOINC CODE: 12646
COLLECTION SAMPLE: BLOOD
SYNONYM: 1 hour GTT
SYNONYM: 1 HR GTT
SYNONYM: GTT, 1HR
SYNONYM: GTT, 1 HOUR
```

Figure 7-11: Sample Lab Test entry #471

This same process is followed with each and every synonym and name in Lab 60.

Any tests, which are not assigned LOINC codes during the auto- matching process, will need to have the LOINC codes assigned manually. This will be the responsibility of each site. An option on the menu called **"MLT Manually Map a LOINC Code to a Laboratory Test"** has been distributed with the patch and should be used to do this individual test mapping.

When the menu option, **MLT Manually Map a LOINC Code to a Laboratory Test**, is chosen, the user is first prompted to enter the name of the test to be mapped. The entire Laboratory Test definition is displayed followed by a numbered listing of the site/specimens, units, and previously assigned LOINC codes. The user continues the mapping by selecting the number of the site/specimen to which a LOINC code will be assigned. The user is then prompted to enter the LOINC Code/Name of the test that is to be mapped as below:

```
Select from the available site/specimens:

    SITE/SPECIMEN                  UNITS          LOINC CODE
    -------------                  -----          ----------
1)  BLOOD                          mmol/L
2)  URINE                          mmol/L
3)  SERUM                                         2951
4)  PLASMA                         mmol/L         2951
5)  FECES                          mEq/L
Select the Site/Specimen Entry for this test:  (1-5): 1

Enter LOINC Code/Name : SODIUM..SER/PLAS  2951
   SODIUM:SCNC:PT:SER/PLAS:QN
Note that if the abbreviation of the site/specimen is entered after" ..", the
search will be narrowed for an appropriate LOINC code.
```

Figure 7-12: Sample MLT option

The details of the LOINC code assigned are displayed and the user is queried as to whether this is the correct code. If "Yes" is answered, the LOINC code will be mapped to the site/specimen selected for the chosen test.

```
LOINC CODE: 2951   SODIUM:SCNC:PT:SER/PLAS:QN
SYSTEM: SER/PLAS                        CLASS: CHEM
COMPONENT: SODIUM
PROPERTY: Substance Concentration
TIME ASPECT: POINT
SCALE TYPE: Quantitative


Is this the correct one? YES

LOINC Code 2951 will be mapped to test SODIUM

Are you sure you want to Map this code to this test? YES

Loinc Code has been successfully mapped.
```

Figure 7-13: Sample MLT option, continued

7.5 Passing LOINC codes from LAB to PCC

The Laboratory Module of RPMS has built in functionality to pass Lab Tests that are accessioned and/or Resulted to the 'Clinical Repository' database in RPMS known as the Patient Care Component or PCC. Tests are accessioned and resulted in the RPMS Laboratory Package and create entries in the IHS Lab Transaction file, which, if all criteria are met, pass selected data to the following file in PCC: V LAB for CH subscript test (General lab).

Those data items which are passed to the PCC V LAB include:

> **NOTE**: the highlighted items were added to both the V LAB file and transaction log file specifically for this project

- Accession Number
- Test Name
- Date and Time of Collection
- **Date and Time of Result**
- **LOINC Code**
- Site/Specimen
- **Collection Sample**
- Result
- Units
- Order Number
- Reference Low
- Reference High
- Therapeutic Low
- Therapeutic High
- Source of Data Input
- Current Status Flag
- Lab Test Cost
- Billable Item
- Ordering Provider

When a transaction log entry is created all data values are set into an array called APCDALVR which is passed to a routine called APCDALVR. This routine takes all data values and populates the V LAB entry.

EXAMPLE: A HEPATITIS B SURFACE ANTIGEN test is done for patient DEMO,MARCY J. This test is accessioned and then resulted in the Laboratory System.

A lab transaction file entry is created by the Laboratory module. The LOINC code is obtained from the Laboratory test file for this test and site/specimen.

The IHS LAB Transaction Log entry looks like this:

```
SEQUENCE NUMBER: 6303                    LRFILE: 2
  PATIENT POINTER VALUE: 12725
  PANEL/TEST POINTER: HEPATITIS B SURFACE ANTIGEN
  LAB MODULE: GENERAL                    DUZ(2): 1575
  I/O CATEGORY: OUT PATIENT              STATUS FLAG: RESULTED
  ENTRY DATE/TIME: MAY 21, 2002@09:15:28
  ASSOCIATED V FILE: V LAB               IEN OF V FILE ENTRY: 129908
  CPT LAB CODE POINTER: HEPATITIS B SURFACE ANTIGEN
  BILLING CPT STRING: 86287|||||
  ORDER DATE: MAY 21, 2002@09:15:26
  ORDER SEQUENCE NUMBER: 1               ORDER NUMBER: 12496
  ORDERING PROVIDER POINTER: MOORE,CATHERINE
  ORDERING LOCATION POINTER: ER-LAB
  COLLECTION DATE/TIME: MAY 21, 2002@09:15:26
  ACCESSION NUMBER: SO 02 160
  COLLECTION SAMPLE POINTER: BLOOD
  COMPLETE DATE: MAY 21, 2002@09:15:57  LOINC CODE: 5195
  RESULT: N
  SITE/SPECIMEN POINTER: BLOOD
```

Figure 7-14: Sample IHS LAB Transaction Log entry

This entry contains all information needed to create a V LAB entry in the PCC database. These data values are stored in the APCDALVR array and passed to the PCC Link routine APCDALVR. This routine takes the data values and creates a corresponding V LAB entry for patient DEMO, MARCY J:

```
LAB TEST:              HEPATITIS B SURFACE ANTIGEN
RESULTS:               N
LR ACCESSION NO.:      SO 02 160
ORDER:                 12496
SITE:                  BLOOD
REFERENCE LOW:         NEG
SOURCE OF DATA INPUT:  LAB
CURRENT STATUS FLAG:   RESULTED
LOINC CODE:            5195
COLLECTION SAMPLE:     BLOOD
COLLECTION DATE AND T: MAY 21, 2002@09:15:26
ORDERING PROVIDER:     MOORE,CATHERINE
ORDERING DATE:         MAY 21, 2002@09:15:26
RESULT DATE AND TIME:  MAY 21, 2002@09:15:57
CPT PTR:               HEPATITIS B SURFACE ANTIGEN
CPT - BILLABLE ITEMS:  86287|||||
LAB TEST:              HIV SCREEN
RESULTS:               N
```

Figure 7-15: Sample V LAB entry

Since the LOINC Code has been passed to PCC this test will be examined to see if it is a test that needs to be flagged to be passed to CDC. That process is described in the next section of this document.

7.6 Flagging Tests for Export and the Export Process

This section describes how tests get flagged for export and the export process. When the Lab patch is installed two files are installed that handle the exporting of data. They are:

- **BLS EXPORT LOINC LIST:** This file contains a list of all LOINC codes that are to be exported. This list is populated during the install process with the initial list of LOINC codes to be exported. The current list has 253 LOINC codes in it. A site can view, add to or delete from this list using the option on the IHS LAB LOINC MENU called "Update Table of LOINC Codes to Export to CDC".

- **BLS LOINC EXPORT**: This file contains a pointer to all V LAB entries that will be exported.

  During the creation of a PCC V Lab entry the test is examined to see if it meets the criteria for export. The PCC routine for creating V File entries is a generic routine that processes all V Files. After a V File entry is created the software does the following:

Is this a V LAB entry? If yes, then:

Are the site parameters turned on to have tests flagged for export? (I '$$ADDON^BLRUTIL("LR*5.2*1013,"BLSLX",DUZ(2)). If yes, then:

Is the current status flag of this V LAB entry set to RESULTED? If yes, then:

Is there a LOINC Code populated in the LOINC code field of this V LAB entry? If yes, then:

Is this LOINC code one that should be flagged for export. The system checks the LOINC code found in the V LAB entry against the file of LOINC Codes to be exported. If this test is one that should be exported, then processing continues. If it is not, nothing is done.

If this is a test to be exported the PCC Link routine then updates the BLS LOINC EXPORT file by adding an entry to that file indicating that this test should be exported.

```
                  ****************************
                  **   IHS Lab LOINC Menu    **
                  ****************************

                          CROW HOSPITAL

   CLN    Cleanup LOINC Export Log/Files
   EXP    Export HL7 Data to CDC
   MLC    Map LOINC Codes to Tests in File 60
   MLT    Manually Map a LOINC Code to a Laboratory Test
   ULE    Update Table of LOINC Codes to Export to CDC
   RSN    Resend CDC Export File
```

Figure 7-16: Sample IHS Lab LOINC Menu

Exporting tests to CDC uses the Generic Interface System (GIS). Once the tests are marked for export, the option Export HL7 Data to CDC is either tasked through TaskMan or run manually.

If tasked it is recommended that it be tasked to run every 30 days. Output from the task will be sent in the BLS EXPORT FILE SENT bulletin. An appropriate mail group should be assigned to this bulletin.

If run automatically the following option dialog is what the user should expect:

```
                          ****************************
                          **   IHS Lab Loinc Menu    **
                          ****************************

                               DULCE HEALTH CENTER


   CLN    Cleanup LOINC Export Log/Files
   EXP    Export HL7 Data to CDC
   MLC    Map LOINC Codes to Tests in File 60
   MLT    Manually Map a LOINC Code to a Laboratory Test
   RSN    Resend CDC Export File
   ULE    Update Table of LOINC Codes to Export to CDC

Select IHS Loinc Menu Option: EXP  Export HL7 Data to CDC
Generating HL7 messages for export

Now writing export file, this could take up to 5 minutes..
Export file BLS20281020020516111408.HL7 in directory  /usr2/cdc created
Sending to IP Address ftp.ihs.gov
File BLS20281020020516111408.HL7 sent to ftp.ihs.gov
```

Figure 7-17: Exporting Files sample dialog

During the process several steps occur:

1. The export software loops through all tests marked for export, for each test it calls the message queuer in GIS.

2. The export software then starts the GIS message and output formatter (^INHFTM and ^INHOTM respectively), this formats the HL7 messages.

3. The export software then takes the formatted messages and writes them out to the Host File System in the directory specified on install and uses the naming convention BLS(ASUFAC)(DATE/TIME).HL7.

4. The created file then gets sent to the IP address/name specified on install.

5. The following is a sample export file:

```
MSH|^~\&|RPMS|RPMS SITE|CEREPLEX|CEREPLEX|20020521100023-0600||ORU^R01|IHS-
280|P|2.4|||AL|AL|
PID|1|12725|101099
PV1|1|O|202810^DULCE HEALTH
CENTER^99IHS|||||||||||||||246452|||||||||||||||||||||||20020521120000-
0600
OBR|1|SO 02 162||5195^HEPATITIS B SURFACE ANTIGEN^LN|||20020521095939-
0600||BLOOD|||||||||||||||F
OBX|1|ST|5195^HEPATITIS B SURFACE ANTIGEN^LN||N||NEG - ||||F
MSH|^~\&|RPMS|RPMS SITE|CEREPLEX|CEREPLEX|20020521100024-0600||ORU^R01|IHS-
281|P|2.4|||AL|AL|
PID|1|12725|101099
PV1|1|O|202810^DULCE HEALTH
CENTER^99IHS|||||||||||||||246452|||||||||||||||||||||||20020521120000-
0600
OBR|1|SO 02 162||7917^HIV SCREEN^LN|||20020521095939-
0600||BLOOD|||||||||||||||F
OBX|1|ST|7917^HIV SCREEN^LN||N||NEGATIVE - ||||F
```

Figure 7-18: Sample export file

7.7 Resending An Export File To CDC

Use the menu option Resend CDC Export File to ftp a previously exported file to CDC.

The following is dialog a user should expect when running the resend:

```
                          ****************************
                          **   IHS Lab Loinc Menu    **
                          ****************************

                               ALBUQUERQUE HOSPITAL


   CLN    Cleanup LOINC Export Log/Files
   EXP    Export HL7 Data to CDC
   MLC    Map LOINC Codes to Tests in File 60
   MLT    Manually Map a LOINC Code to a Laboratory Test
   RSN    Resend CDC Export File
   ULE    Update Table of LOINC Codes to Export to CDC

Select IHS Loinc Menu Option: RSN  Resend CDC Export File
1 - BLS20210120020509154422.HL7
Resend which file(s) :  (1-1): 1
Sending export file BLS20210120020509154422.HL7 in directory /usr13/sentinal/
Sending to IP Address ftp.ihs.gov
File BLS20210120020509154422.HL7 sent to ftp.ihs.gov
```

Figure 7-19: Resending an Export File, Sample Dialog

7.8 Export Log/File Maintenance Options

The Cleanup LOINC Export Log/Files menu option should be run periodically to eliminate unnecessary disk usage. The cleanup option will purge log entries and files that are older than the specified period in the LOINC DAYS TO KEEP LOG FILE field of the BLR MASTER CONTROL FILE. If this field is blank then it defaults to 30 days.

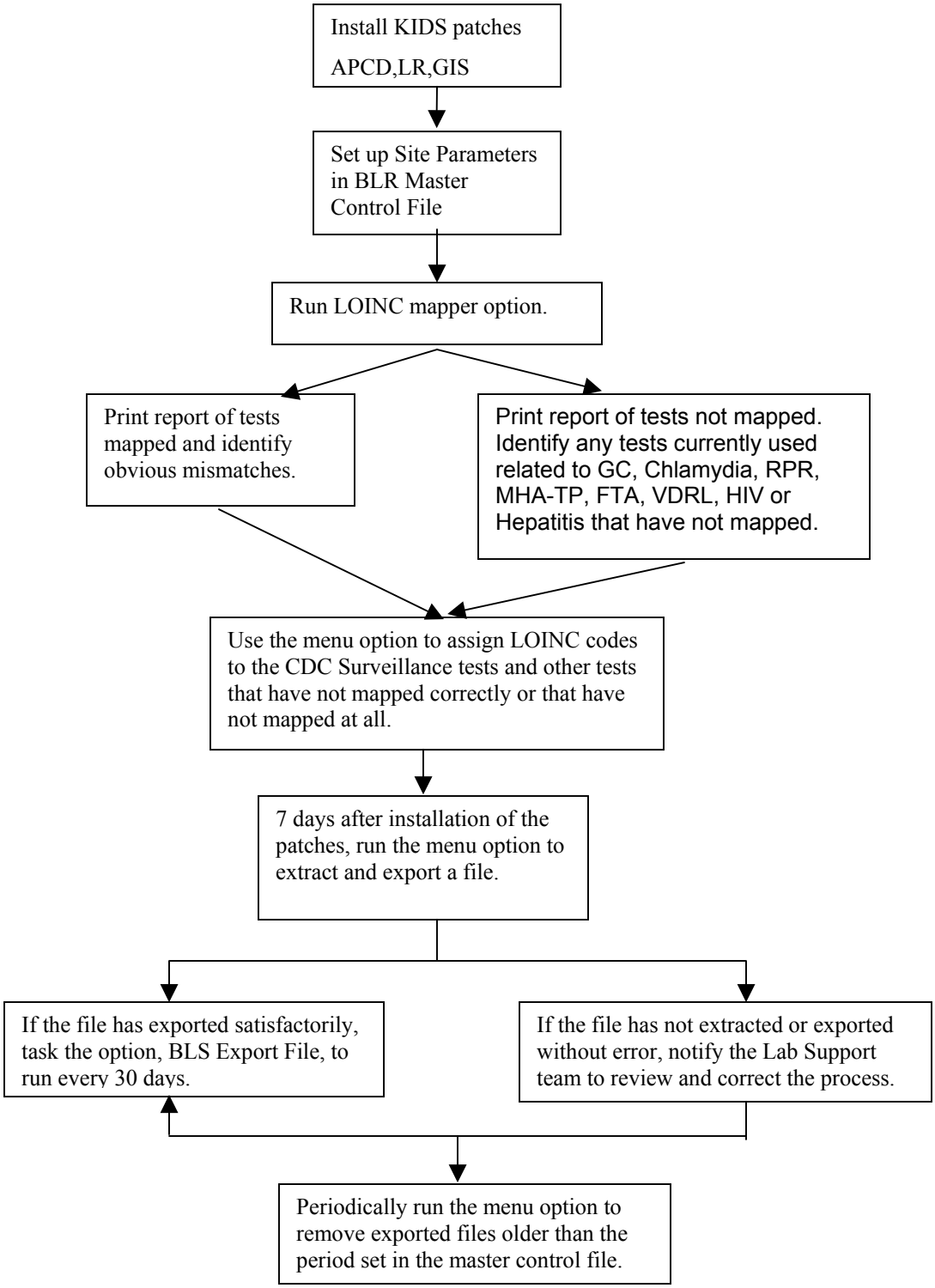
The following is dialog a user should expect when running the cleanup:

```
                          ****************************
                          **   IHS Lab Loinc Menu    **
                          ****************************

                               DULCE HEALTH CENTER


   CLN    Cleanup LOINC Export Log/Files
   EXP    Export HL7 Data to CDC
   MLC    Map LOINC Codes to Tests in File 60
   MLT    Manually Map a LOINC Code to a Laboratory Test
   RSN    Resend CDC Export File
   ULE    Update Table of LOINC Codes to Export to CDC

Select IHS Loinc Menu Option: CLN  Cleanup LOINC Export Log/Files
Now cleaning up export log file entries older than May 15, 2002........

Now cleaning up host files older than May 15, 2002

FILENAME LIST will be here
```

Figure 7-20: Clean up LOINC Export Log, sample dialogue

7.9 Flow Sheet

Flow sheet of CDC Surveillance Project – Site Implementation



8.0 Contact Information

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